

**ABSTRACT OF THE DISCLOSURE**

A method and composition for removing silicon-containing sacrificial layers from Micro Electro Mechanical System (MEMS) substrates having such sacrificial layers is described. The etching compositions include a supercritical fluid, an etchant species, a co-solvent, and optionally a surfactant. Such etching compositions overcome the intrinsic deficiency of SCFs as cleaning reagents, viz., the non-polar character of SCFs and their associated inability to solubilize polar species that must be removed from the semiconductor substrate. The resultant etched MEMS substrates experience lower incidents of stiction relative to MEMS substrates etched using conventional wet etching techniques.